

Appl. No. 10/579,799
Amendment dated: August 2, 2010
Reply to OA of: February 2, 2010

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1(currently amended). A method for the conversion into carbon of gaseous hydrocarbons extracted from a natural hydrocarbon reservoir, which method comprises contacting said gaseous hydrocarbon at a pressure of from 3 to 6 bar and an elevated temperature in a reactor with a catalyst capable of converting said hydrocarbon to carbon and hydrogen; separating hydrogen produced from unconverted hydrocarbon; burning said hydrogen to generate energy; and using the energy generated to heat said reactor or the gaseous hydrocarbon flow thereto, or to heat or power a heat or power consuming apparatus.

2(original). The method as claimed in claim 1 wherein the energy generated is used to heat said reactor or the gaseous hydrocarbon flow thereto.

3(original). The method as claimed in claim 1 wherein the energy generated is used to power an electricity generator.

4(previously presented). The method as claimed in claim 1, wherein said catalyst is particulate.

5(currently amended). The method as claimed in claim 1, wherein said catalyst is a Raney metal porous metal catalyst comprising a transition metal or an alloy thereof.

6(previously presented). The method as claimed in claim 1, wherein said catalyst comprises an element selected from Ni, Co and Fe.

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7(previously presented). A method as claimed in claim 1 wherein said catalyst is particulate with a mode particle size of 1 to 300 μ m.

8(previously presented). A method as claimed in claim 7 wherein hydrogen is burned in an internal combustion engine.

9(previously presented). A method as claimed in claim 1 wherein the hydrogen is separated from the unconverted hydrocarbon using a hydrogen-permeable membrane.

10-11(cancelled).

12(withdrawn). A process for the preparation of fibrous carbon which comprises contacting a metallic catalyst with a carbon-containing gas at elevated temperature, characterized in that said catalyst is sponge iron.

13(previously presented). A method as claimed in claim 1 wherein said heat or power consuming apparatus is an air or water heating apparatus.

14(previously presented). The method as claimed in claim 1 wherein said hydrogen contains no more than 30 mole % hydrocarbon.

15(previously presented). The method as claimed in claim 1 wherein said hydrogen contains no more than 10 mole % hydrocarbon.

16(previously presented). The method as claimed in claim 1 wherein said hydrogen contains no more than 5 mole % hydrocarbon.

17(previously presented). The method as claimed in claim 1 wherein said

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hydrogen contains no more than 1 mole % hydrocarbon.

18(previously presented). The method as claimed in claim 1 wherein said gaseous hydrocarbon is taken direct from a hydrocarbon well.

19(previously presented). The method as claimed in claim 1 wherein said catalyst has a transition metal content of at least 50% nickel.

20(previously presented). The method as claimed in claim 1 wherein said catalyst is a porous metal catalyst comprising a transition metal or an alloy thereof.

21(previously presented). The method as claimed in claim 20 wherein said catalyst is particulate.

22(previously presented). The method as claimed in claim 21 wherein said catalyst surface area is at least 20 m²/g.

23(previously presented). The method as claimed in claim 21 wherein said catalyst surface area is up to 200 m²/g

24(previously presented). The method as claimed in claim 21 wherein said catalyst surface area is 50-100 m²/g

25(previously presented). The method as claimed in claim 21 wherein said mode particle size is 5 to 100µm.

26(previously presented). The method as claimed in claim 21 wherein said mode particle size is 20 to 40µm.

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27(previously presented). The method as claimed in claim 21 wherein said particle size is 10nm to 100 μ m.

28(previously presented). The method as claimed in claim 1 wherein the gaseous hydrocarbon is, or comprises, methane.

29(previously presented). The method as claimed in claim 1 wherein the gaseous hydrocarbon comprises methane and carbon monoxide in a mole ratio of 1:99 to 99:1.

30(previously presented). The method as claimed in claim 1 wherein the gaseous hydrocarbon comprises 1 to 20% mole hydrogen.

31(cancelled).

32(previously presented). The method as claimed in claim 1 wherein said method is performed continuously.

33(previously presented). The method as claimed in claim 1 wherein said method is performed batchwise.

34(previously presented). The method as claimed in claim 1 wherein said hydrogen is separated from said unconverted hydrocarbon by passing gas removed from the reactor through a separator in which hydrogen is removed by metallic hydride formation.

35(previously presented). The method as claimed in claim 1 wherein said hydrogen is separated from said unconverted hydrocarbon using pressure swing adsorption.

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36(previously presented). A method for the conversion into carbon of gaseous hydrocarbon taken directly from a hydrocarbon well, which method comprises

contacting said gaseous hydrocarbon at an elevated temperature in a reactor with a porous metal catalyst comprising a transition metal or an alloy thereof, which is capable of converting said hydrocarbon to carbon and hydrogen;

separating hydrogen produced from unconverted hydrocarbon;

burning said hydrogen to generate energy; and

using the energy generated to heat said reactor or the gaseous hydrocarbon flow thereto.